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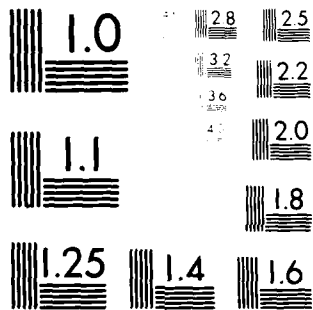
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(9) Final report

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NORDA Technical Note 79

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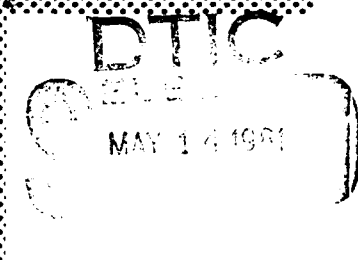
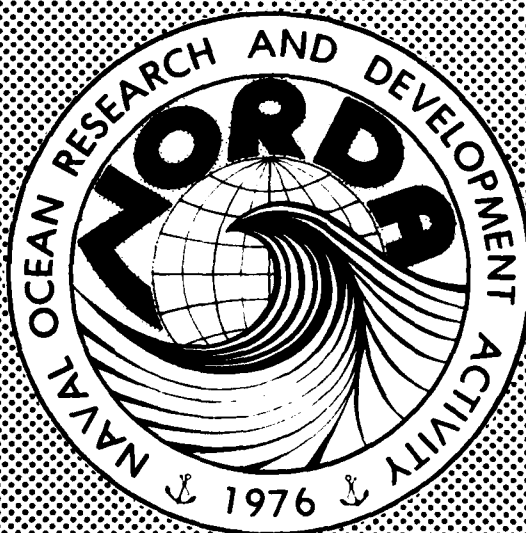
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Naval Ocean Research
and Development Activity
NSTL Station, Mississippi 39529

**Oceanographic Management Information
System (OMIS): The Navy Oceanographic
Requirements Database, Development Phase.**

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(10) S. Wasowski

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Environmental Requirements and
Program Analysis Group

(11) Mar 1981

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ABSTRACT

The Navy's Oceanographic Requirements (NOR) relate to the oceanographic/environmental needs of Navy systems and fleet units in a wide variety of scientific and technological disciplines. The NOR database is a collection of information pertaining to the current needs expressed by the fleet or derived from system specifications. The objective of the database is to provide an information tool to management. Data elements include the scientific and technical parameters related to systems and requirements, priority and action agency. The same closed vocabulary keyword system used in the Navy Oceanographic Program (NOP) database is used to provide correlation between the datasets. This database has been turned over to the Naval Oceanographic Office, Information Systems Office, for operation as part of the overall Oceanographic Management Information System.

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ACKNOWLEDGEMENTS

I would like to acknowledge the support of the Oceanographer of the Navy, the Navy Oceanography Command, and the Naval Oceanographic Office for their support in the development of this database.

Thanks to CAPT T. J. McCloskey (NORDA), under whose supervision this project began, and to LCDR W. Donat (NAVOCEANO), whose guidance and suggestions greatly aided in the shaping of the NOR Database.

Finally, a special note of thanks to Mr. C. Wilcox and Mr. G. Stanford of NORDA, and Mr. S. Elam of Analysis and Technology, who provided the requirements analysis for input into the system.

INTRODUCTION

The Navy's Oceanographic Program contains many diverse projects in a wide variety of scientific and technological disciplines. The task of overseeing such a program effectively is challenging. To make this task more manageable, the Oceanographer of the Navy established the requirement for an Oceanographic Management Information System (OMIS). This system is to be comprised of several subsets, one of which, the Navy Oceanographic Requirements Database, is the subject of this paper.

The purpose of this report is to make the existence of this database known to scientists and management of NORDA. This is the first step in evaluating the in-house utility and effectiveness of this capability.

NAVY OCEANOGRAPHIC REQUIREMENTS: OVERVIEW

The NOR was designed to provide quick access to information about the Navy's Oceanographic Requirements. These consist of Fleet Operational Requirements as well as system generated requirements. Information on the oceanographic parameters related to the requirements are held in one file. This file can then be used to link with the Navy Oceanographic Program (NOP) Database to find ongoing Navy programs related to the Requirements. The commonality of the keyword vocabulary in both systems provides the desired link between programs and requirements. Another file contains a requirement description, a list of related requirements, the status and the cognizant Navy office for the requirements.

The keyword information is supplied by an analyst with experience in the subject matter of the work unit. The entire information set is then input into a general purpose computerized database management system for storage and retrieval.

NOR DETAILED VIEW

The Software

The NOR Database is operated under the "CREATABASE" software system which is proprietary to the Daniel Analytical Services Corporation. CREATABASE is part of an extensive information management and analysis system and represents the data storage and retrieval capabilities of the system. The organization of the data files is essentially relational, which means that any data element of a record may be searched, rather than just "keyed" elements. In addition, the system is extremely flexible, in that data elements may be changed or new data elements defined for the database without necessitating a major reprogramming effort. These characteristics were deemed essential for keeping track of a dynamic entity, such as the Navy's Oceanographic Program, without devoting an inordinate amount of resource to reprogramming or "freezing" the system at a particular state and forcing all subsequent information to conform to that system.

CREATABASE allows three types of data elements, a NAME type data element for alphanumeric or text information, a FROM-TO type data element for numeric information and a CODE type data element for data which exist only in specific states (for example, classified or unclassified).

A record consists of a set of data elements. Any record or set of records may be isolated from the database if the information in that record matches the logical constraints of a user-defined query. A query specifies a data element or collection of data elements and the value, set of values, or range of values which the data

element must have in order to be selected. Some examples of queries and system responses are given in the section on Data Elements. The logic of the selection criteria in the query as well as the length of the query are not constrained by the system. This gives the user a tremendous amount of flexibility in designing a query.

The basic display of CREATABASE is just a listing of selected data elements from records isolated by a query. This may be a limitation initially; however, the capability exists for passing the selected information to external routines for additional processing. Thus, the requirement, for example, for a regular report formatted with column headings and including subtotals and totals could be readily accommodated. In addition a graphics package is associated with the overall system, which also enhances the output capabilities. Thus, the apparent limitation in the display capability of CREATABASE itself is not considered a serious shortcoming.

CREATABASE allows for the timely initiation of a reasonably sophisticated information system, and also allows that system to grow and develop as the requirements on that information system change.

The Data Elements

As outlined in the overview, the information in the NOR covers items that describe Navy Requirements for oceanographic R & D. These areas are covered in two datafiles, one dealing with the scientific and technical parameters and their importance to the system or requirement, the other dealing with the current status of the requirement.

In the parameter datafile, the data elements consist of system/requirement identification, parameter, and criticality. The parameters are those listed in the closed vocabulary keyword system. Every parameter is assigned a criticality for each system or requirement.

In the status datafile, the data elements consist of system/requirement identification, originator, priority, up to five related requirements, action office and current status. The specific data element names are given in Table 1.

Any of these data elements can be searched. In addition, any combination of data elements with their associated qualifications or restrictions may be searched and, in turn, any of the data elements can be displayed. Since the information in the DATABASE is continually being updated, any examples listed here may no longer reflect accurately the present program. However, for the purpose of illustration several sample queries are included here which reflect the state of the database on 14 November 1979. These queries are given to show some of the system's capabilities for producing answers to real questions.

a) In the PARAMETER Datafile:

Example 1: Produce a listing of the systems for which man-made noise is a very important or critical factor.

SORT AND PRINT REQUIREMENT, (PARAMETER, CRITICALITY) FOR ENTRIES WITH PARAMETER, MAN-MADE NOISE AND CRITICALITY, VERY IMPORTANT OR CRITICAL*

ISOLATIONS	TOTAL	PERCENTAGE
9	1158	.78

ADAS		
MAN-MADE NOISE	CRITICAL	
RDSS		
MAN-MADE NOISE	VERY IMPORTANT	
SOSUS		
MAN-MADE NOISE	VERY IMPORTANT	
SSQ-041		
MAN-MADE NOISE	CRITICAL	
SSQ-053		
MAN-MADE NOISE	CRITICAL	
SSQ-057		
MAN-MADE NOISE	CRITICAL	
SSQ-077		
MAN-MADE NOISE	CRITICAL	
SSQ-079		
MAN-MADE NOISE	CRITICAL	
SURTASS		
MAN-MADE NOISE	VERY IMPORTANT	

b) In the STATUS Datafile:

Example 2: Produce a listing of the requirements with 'A' priority.
 SORT AND PRINT DEFINITION FOR WITH PRIORITY, A*

ISOLATIONS	TOTAL	PERCENTAGE
2	44	4.55
EFFECTS OF SOUND TRANSMISSION IN AND ACROSS FRONTS		
THERMAL EFFECTS ON OCEAN ACOUSTICS		

Example 3: List the requirement identifiers, related requirements and action office for the above requirements.
 PRINT SYSTEM-REQT, (RELATED REQT) ACTION FOR THOSE SAME ENTRIES -- WITH HOLD*

ISOLATIONS	TOTAL	PERCENTAGE
2	44	4.55
LANT-01		
PAC-10	EUR-01	---
COMNAVOCEANCOM		---
EUR-01		
PAC-10	LANT-01	---
COMNAVOCEANCOM		---

Data Sources

The information related to systems was derived from an analysis of system specifications and system performance. This work was accomplished using both in-house NORDA expertise and contractors. The fleet requirements were derived from a list compiled by the Navy Oceanography Command. Both sets of information were reviewed by subject matter specialists in NORDA Code 115, who bring to this effort years of experience and involvement with the Navy's oceanographic requirements.

Retrieval and Access Methods

Some specifics of the retrieval process were illustrated in the examples given in the section on data elements. The underlying software system, in order to keep computer overhead to a minimum, does not perform an elaborate set of checks on the user to ascertain whether the operations he is attempting are the ones which are

Table 1. Data elements for NOR database

STATUS FILE

<u>#</u>	<u>NAME</u>	<u>DESCRIPTION</u>
1	SYSTEM-REQT	Brief description or title of the requirement or system.
2	ORIGINATOR	Submitter of the requirement or responsible for the system.
3	PRIORITY	Priority assigned to requirement.
4	R1	Related requirement or system.
5	R2	Related requirement or system.
6	R3	Related requirement or system.
7	R4	Related requirement or system.
8	R5	Related requirement or system.
9	ACTION	Action office in the Navy.
10	STATUS	What is happening now.
11	RELATED REQT	Combination of descriptors 4,5,6,7,8.
12	DESCRIPTION	Brief description of system or requirement.

PARAMETER FILE

1	SYSTEM-REQT	Same as 1 above.
2	CRITICALITY	Rating of the relative importance of the parameter in descriptor 3.
3	PARAMETER	Oceanographic or operational parameter affecting #1.

actually intended. In other words, the software system assumes a friendly user who is familiar with the system's operation. Because of this lack of systems checks, an unfamiliar user could easily wipe out an entire dataset by executing the wrong command. To avoid this, and to allow access to the information to outside users without first having to learn the system, access to the system's information is through a human interface. A prospective user of the information would call up NORDA Code 115 and describe the information desired. The query would then be processed and the reply furnished by a return phone call or other means if the information was such that the telephone was inappropriate (e.g., for security reasons). Thus, the user need only know what information he requires in order to exercise the system.

When system usage becomes heavy enough to warrant the development of a direct user access capability, the present access system will be re-evaluated. The major objective of this system is to make programmatic information available to management level personnel in a manner timely enough to be of significant use in their decision-making process.

To request more information about the system, or to query the database, correspondence should be directed to:

Commanding Officer
Naval Ocean Research and Development Activity
Attn: Code 115 NOR DATABASE
NSTL Station, MS 39529

or telephoned:

A/V 485-4887
FTS 494-4887
Commercial 601-688-4887

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- Vinson, Philip S. (1980). Acoustic Reference Service, A Subset of the Oceanographic Management Information System. NOO-RP-29, Naval Oceanographic Office, NSTL Station, Miss.
- Wasowski, S. (1980). Oceanographic Management Information System (OMIS): The Navy Oceanographic Program Database. NORDA Technical Note 67, Naval Ocean Research and Development Activity, NSTL Station, Miss.

Appendix

Oceanographic Management Information

System Data Sheet

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OCEANOGRAPHIC MANAGEMENT INFORMATION SYSTEM DATA SHEET

ACCESSION NUMBER

MIS I.D. NUMBER

KEYWORD LIST---circle those which apply

A. PROJECT THRUST

Measurements
Survey
Theory

Models
Analysis
Hardware
Prediction

Software
Fleet Exercise Support
N/A

B. WARFARE AREA SUPPORTED

(AS) Anti-submarine Warfare
(DS) Surveillance
(MW) Mine Warfare
(AW) Amphibious

(AA) Anti-air
(SH) Anti-surface Ship
Strike
(SW) Special (Inshore, Riverine,
Beach Recco, e.g.)

(CC) C3
EW
(SL) Logistics
Intelligence
(SB) Seabased Strategic
(PN) Personnel-medical

C. MAJOR AREA

Administration
Operations
Meteorology
Remote Sensing

Oceanography
Acoustics
Geology/Geophysics
Documentation/Planning

Cartography
Special Programs
Special Areas
Hydrography

D. FIRST LEVEL SUB AREA

OCEANOGRAPHY/METEOROLOGY

Biological
Chemical
Physical
Dynamic/Synoptic
Engineering-construction
Diving-medical
Other Oceanographic
Other Meteorologic
Climatology

ACOUSTICS

Transmission
Reverberation
Ambient Noise
Bottom Interaction
Measurement Systems
Low Frequency
Mid Frequency
High Frequency
Other Acoustic

GEOLOGY/GEOPHYSICS/CARTOGRAPHY

Sea Floor Structure
Sediment Dynamics
Sea Floor Acoustics
Gravity
Magnetism
Bathymetry
Seismic Profiling
Navigation
Other Geologic

OTHER

Indian Ocean
Southern
Hemisphere
Arctic-Antarctic
Coastal -Shallow
Straits
Other Special Area
Satellite
Communications
Instrumentation
Other Remote Sens.
Display

E. SECOND LEVEL SUB AREA

Air-sea Interaction
Surface Waves/seastate
Sound Velocity
Salinity/Conductivity
Temperature
Currents
Discontinuities
Internal Waves
Vertical Shear

Horizontal Noise
Vertical Noise
Depth Dependence
Noise Fluctuations
Noise Coherence
Man-Made Noise
Natural Noise
Other Noise

Direct Transmission
Duct Transmission
Half Channel Trans.
RAP Mode Trans.
Convergence Zone
Bottom Transmission
Signal Fluctuations
Signal Coherence
Signal Characteristics
Other Transmission

Cloud Cover
Fog
Atmos. Ducting
E.M.I.
Wind
Storms

F. LOCATION

WATER DEPTH

Coastal/Shallow
Shelf/Mid-Depth
Deep Ocean

PLACE IN WATER COLUMN

Near Surface
Mid Depths
Near Bottom

ATMOSPHERIC REGIME

Troposphere
Stratosphere
Ionosphere

PLACE IN SPHERE

Lower
Middle
Upper

LABORATORY WORK

NOT APPLICABLE

OTHER

COMMENTS

REVIEWER

Security Classification and Downgrading				NAVAL OCEAN RESEARCH AND DEVELOPMENT ACTIVITY NSTL STATION, MISSISSIPPI 39529			
RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION* 3		2. DATE OF SUMMARY*	
3. DATE PREV SUMMARY		4. KIND OF SUMMARY		5. SUMMARY SCTY* 1		6. WORK SECURITY* 2	
7. REGRADING*		8a. DISSEM INSTR* <input type="checkbox"/> YES <input type="checkbox"/> NO		8b. SPECIFIC DATA CONTRACTOR ACCESS <input type="checkbox"/> YES <input type="checkbox"/> NO		9. LEVEL OF SUM A. WORK UNIT	
10. NO/CODES*		PROGRAM ELEMENT 13		PROJECT NUMBER 14		TASK AREA NUMBER 15	
a. PRIMARY		b. CONTRIBUTING		c. CONTRIBUTING			
11. TITLE (Precede with Security Classification Code)* 4							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS*							
13. START DATE		14. ESTIMATED COMPLETION DATE		15. FUNDING AGENCY		16. PERFORMANCE METHOD	
17. CONTRACT/GRANT				18. RESOURCES ESTIMATE		a. PROFESSIONAL MAN YEARS	
a. DATES, EFFECTIVE				PRECEDING		b. FUNDS (in thousands)	
b. NUMBER*				FISCAL YEAR		17	
c. TYPE				CURRENT		20	
d. KIND OF AWARD				16		18	
19. RESPONSIBLE DOD ORGANIZATION				20. PERFORMING ORGANIZATION			
NAME* 9 NAVAL OCEAN RESEARCH AND DEVELOPMENT ACTIVITY				NAME* 5			
ADDRESS* NSTL STATION, MS 39529				ADDRESS*			
RESPONSIBLE INDIVIDUAL				PRINCIPAL INVESTIGATOR (Furnish SSAN if U.S. Academic Institution)			
NAME 10				NAME* 6			
TELEPHONE 11 12				TELEPHONE 7 8			
21. GENERAL USE				SOCIAL SECURITY ACCOUNT NUMBER			
				ASSOCIATE INVESTIGATORS			
				NAME			
				NAME			
22. KEYWORDS (Precede EACH with Security Classification Code)							
23. TECHNICAL OBJECTIVE* 24. APPROACH 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code.)							
<p>The bold numbers which appear in the boxes above represent the data element numbers of the MIS (Table 1).</p>							
*Available to contractors upon originator's approval.				Security Classification and Downgrading			

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER NORDA Technical Note 70	2. GOVT ACCESSION NO. AD-A098	3. RECIPIENT'S CATALOG NUMBER 606
4. TITLE Ocean Management and Information System (OMIS): The Navy Oceanographic Requirements, Database	5. TYPE OF REPORT & PERIOD COVERED Final	
6. AUTHOR(s) S. Wasowski	7. PERFORMING ORG. REPORT NUMBER	
8. PERFORMING ORGANIZATION NAME AND ADDRESS Naval Ocean Research & Development Activity Environmental Requirements & Programs Office NSTL Station, Mississippi 39529	9. CONTRACT OR GRANT NUMBER(s)	
10. CONTROLLING OFFICE NAME AND ADDRESS	11. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS	
12. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)	13. REPORT DATE	
	14. NUMBER OF PAGES 9	
	15. SECURITY CLASS. (of this report) UNCLASSIFIED	
	16. DECLASSIFICATION/DOWNGRADING SCHEDULE	
17. DISTRIBUTION STATEMENT (of this Report) Unlimited		
18. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
19. SUPPLEMENTARY NOTES		
20. KEY WORDS (Continue on reverse side if necessary and identify by block number) Navy Oceanographic Requirements Environmental Needs Vocabulary Keyword System		
21. ABSTRACT (Continue on reverse side if necessary and identify by block number) The Navy's Oceanographic Requirements relate to the oceanographic/environmental needs of Navy system and fleet units in a wide variety of scientific and technological disciplines. The NOR database is a collection of information pertaining to the current needs expressed by the fleet or derived from system specifications. The objective of the database is to provide an information tool to management. Data elements include the scientific and technical parameters related to systems and requirements, priority and action agency. The		

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same closed vocabulary keyword system used in the Navy Oceanographic Program database is used to provide correlation between the datasets.

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